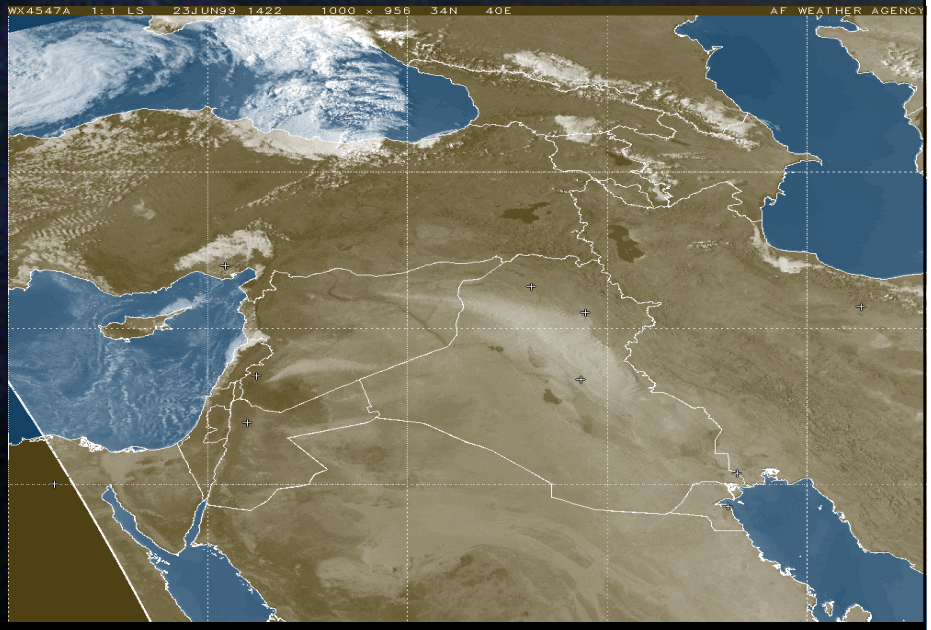

National Polar-orbiting Operational Environmental Satellite System
Technology Transition
Activities, Capabilities, and Plans

Outline

- NPOESS Background
- Planning For the Future
- Partnering with National/International Experts
- Transitioning Today's Technology
  - Bridging science to operations
  - Leveraging instruments and data sources
  - Risk Reduction Activities
- Developing Tomorrow's Technology
  - State of the Art in Remote Sensing, Algorithms, Command Control and Communications

Establishing NPOESS

- National Performance Review (NPR) -- September 1993
- OSTP Convergence Implementation Plan submitted to Congress -- May 1994
- Presidential Decision Directive/NSTC-2 -- May 1994
- Tri-agency Memorandum of Agreement (MOA) --May 1995
- EUMETSAT/NOAA Initial Joint Polar Agreement -- November 1998

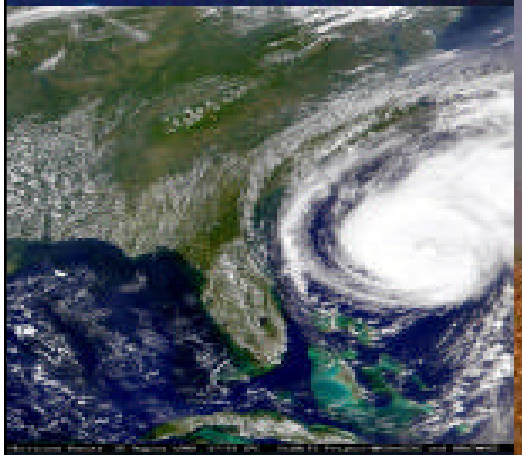


DMSP smoothed visible data over color enhanced background (1.5nm res)

Global Challenges

Obtaining the weather information needed to protect life and property

- Environmental information for long term support to world's population
- Disaster support
- Understanding climate and climate change

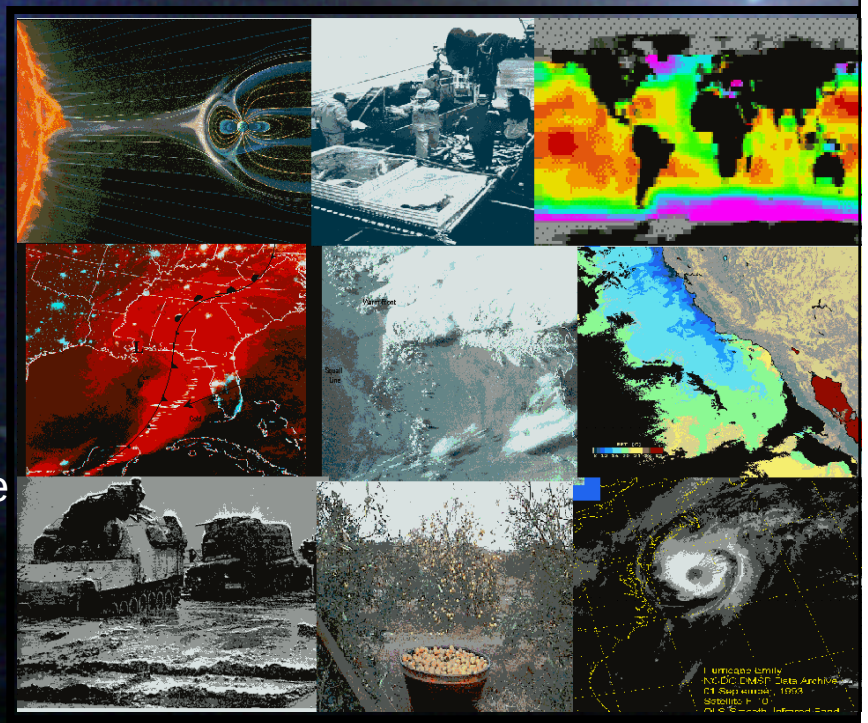


Mozambique Floods

Requirements

Convergence of alternatives

- Integrated Operational Requirements Document (IORD-IA)
  - 58 Data Products
  - 9 Enhancement Data Products
- Validated by
  - Deputy Under Secretary of Commerce for Oceans and Atmosphere
  - Vice Chairman of Joint Chiefs of Staff
  - NASA Associate Administrator for Earth Science Enterprise



Convergence of requirements

Converged requirements provide foundation for combined program

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Requirements

★	Atmospheric Vertical Moisture Profile	Downward Longwave Radiance (Sfc)	Precipitable Water
★	Atmospheric Vertical Temp. Profile	Electric Fields	Precipitation Type/Rate
★	Imagery	EDPs/Ionospheric Specification	Pressure (Surface/Profile)
★	Sea Surface Temperature	Fresh Water Ice	Radiation Belt/Low Energy Particles
★	Sea Surface Winds	Geomagnetic Field	Sea Ice Age and Edge Motion
★	Soil Moisture	Ice Surface Temperature	Sea Surface Height/Topography
	Aerosol Optical Thickness	In-situ Ion Drift Velocity	Snow Cover/Depth
	Aerosol Particle Size	In-situ Plasma Density	Solar EUV Flux
	Albedo (Surface)	In-situ Plasma Fluctuations	Solar Irradiance
	Auroral Boundary	In-situ Plasma Temperature	Solar/Galactic Cosmic Ray Particles
	Auroral Imagery	Insolation	Supra-Thermal - Auroral Particles
	Cloud Base Height	Ionospheric Scintillation	Surface Wind Stress
	Cloud Cover/Layers	Land Surface Temperature	Suspended Matter
	Cloud Effective Particle Size	Littoral Sediment Transport	Total Auroral Energy Deposition
	Cloud Ice Water Path	Net Heat Flux	Total Longwave Radiance (TOA)
	Cloud Liquid Water	Net Short Wave Radiance (TOA)	Total Water Content
	Cloud Optical Depth/Transmittance	NDPs/Neutral Atm Specification	Turbidity
	Cloud Top Height	Normalized Diff. Vegetation Index	Upper Atmospheric Airglow
	Cloud Top Pressure	Ocean Color/Chlorophyll	Vegetation Index/Surface Type
	Cloud Top Temperature	Ocean Wave Characteristics	
	Currents (Ocean)	Ozone - Total Column/Profile	

VIIRS CMIS CrIS/ATMS OMPS SESS GPSOS ERBS TSIS ALT

★ Environmental Data Records (EDRs) with Key Performance Parameters

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Environmental Data Records

- ★ Atmospheric Vertical Moisture Profile
- ★ Atmospheric Vertical Temperature Profile
- ★ Imagery
- ★ Sea Surface Temperature
- ★ Sea Surface Winds
- ★ Soil Moisture
- Aerosol Optical Thickness
- Aerosol Particle Size
- Albedo (Surface)
- Auroral Boundary
- Auroral Imagery
- Cloud Base Height
- Cloud Cover/Layers
- Cloud Effective Particle Size
- Cloud Ice Water Path
- Cloud Liquid Water
- Cloud Optical Depth/Transmittance
- Cloud Top Height
- Cloud Top Pressure
- Cloud Top Temperature
- Currents (Ocean)
- Downward Longwave Radiance (Sfc)
- Electric Fields
- Electron Density Profile
- Fresh Water Ice
- Geomagnetic Field
- Ice Surface Temperature
- Energetic Ions
- In-situ Plasma Fluctuations
- In-situ Plasma Temperature
- Insolation
- Ionospheric Scintillation
- Medium Energy Charged Particles
- Land Surface Temperature
- Littoral Sediment Transport
- Net Heat Flux
- Net Short Wave Radiance (TOA)
- Neutral Density Profile
- Neutral Winds
- Normalized Difference Vegetation Index
- Ocean Color/Chlorophyll
- Ocean Wave Characteristics
- Ozone - Total Column/Profile
- Precipitable Water
- Precipitation Type/Rate
- Pressure (Surface/Profile)
- Sea Ice Age and Edge Motion
- Sea Surface Height/Topography
- Snow Cover/Depth
- Solar Irradiance
- Supra-Thermal - Auroral Particles
- Surface Wind Stress
- Suspended Matter
- Total Auroral Energy Deposition
- Total Longwave Radiance (TOA)
- Total Water Content
- Turbidity
- Vegetation Index/Surface Type

Atmospheric | Oceanic | Terrestrial | Space | Climate

★ Environmental Data Records (EDRs) with Key Performance Parameters

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NPOESS Payloads

NPOESS Instruments	0530	1330	METOP 0930	NPP 1030
IPO Developed				
Visible/IR Imager Radiometer Suite (VIIRS)*	X	X	X (AVHRR)	X
Cross-track IR Sounder (CrIS)*		X	X (IASI/HIRS)	X
Conical MW Imager/Sounder (CMIS)*	X	X		
Ozone Mapper/Profiler Suite (OMPS)		X	X (GOME)	
GPS Occultation Sensor (GPSOS)	X	X	X (GRAS)	
Space Environmental Sensor Suite (SESS)	X	X	X (SEM)	
Leveraged				
Advanced Technology MW Sounder (ATMS)*		X	X (AMSU/MHS)X	
Data Collection System (DCS)	X	X	X	
Search and Rescue (SARSAT)	X		X	
Earth Radiation Budget Sensor (ERB)		X		
Solar Irradiance Sensor (TSIS)	X			
Radar altimeter (ALT)	X			
Advanced Scatterometer (ASCAT)			X	

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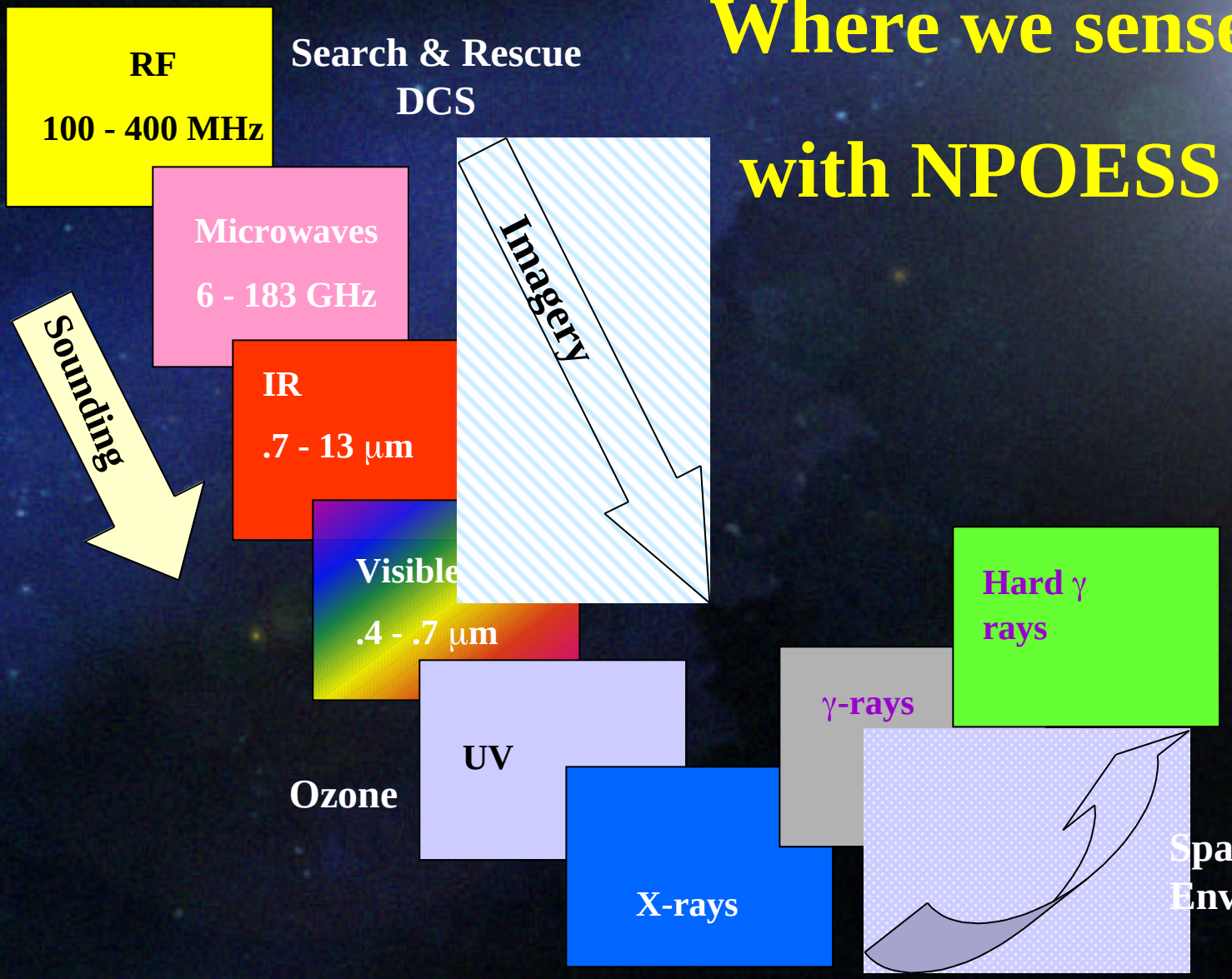
Where we sense with NPOESS



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DMSP/POES to NPOESS Convergence / Evolution of Missions

-Imaging
-Sounding
-Space Environment

DMSP

-Imaging
-Sounding
-Climate
-Ozone
-Space Environment

POES

-Imaging
-Sounding
-Climate
-Ozone
-Space Environment

NPOESS

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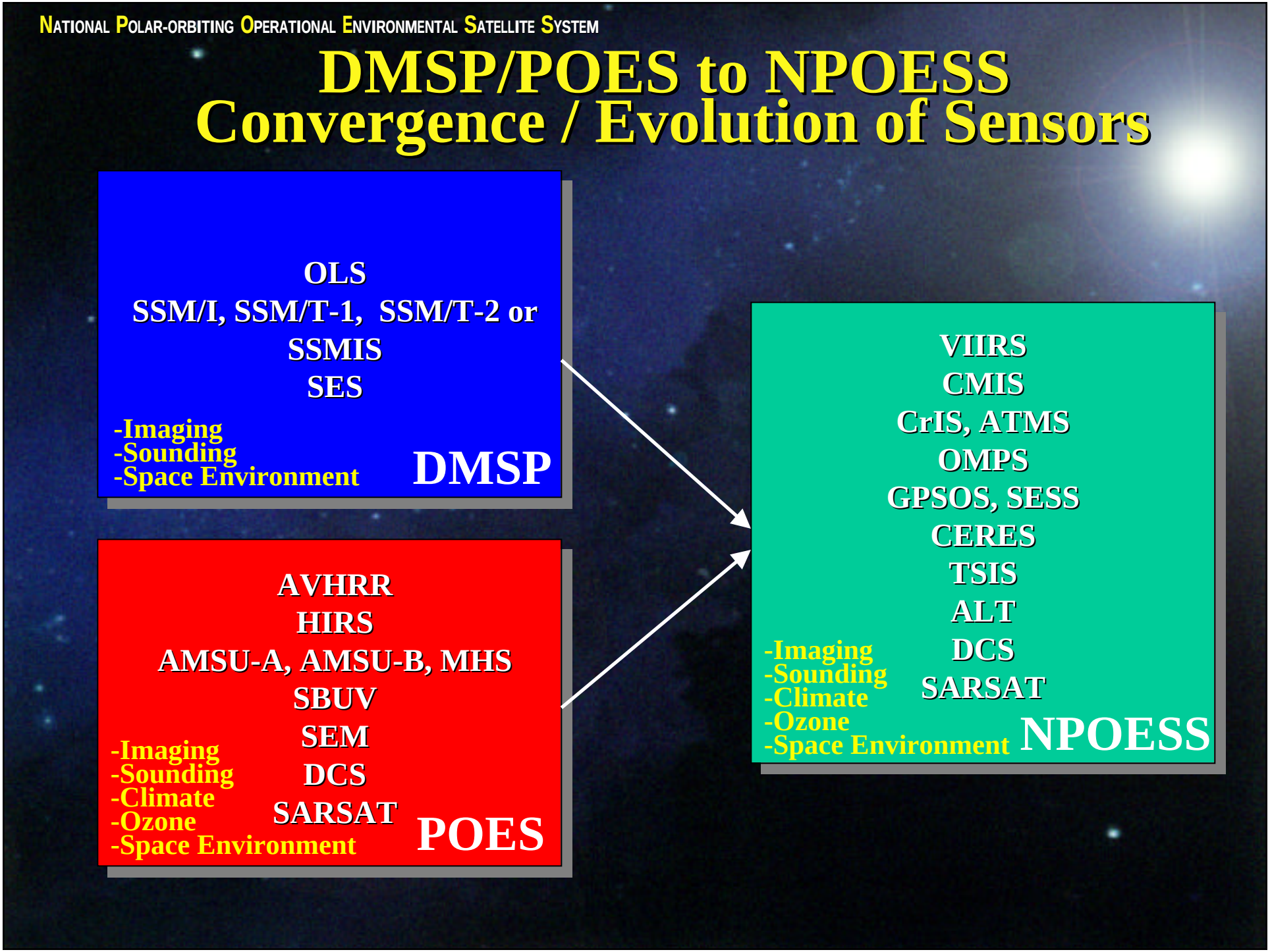
DMSP/POES to NPOESS Convergence / Evolution of Sensors



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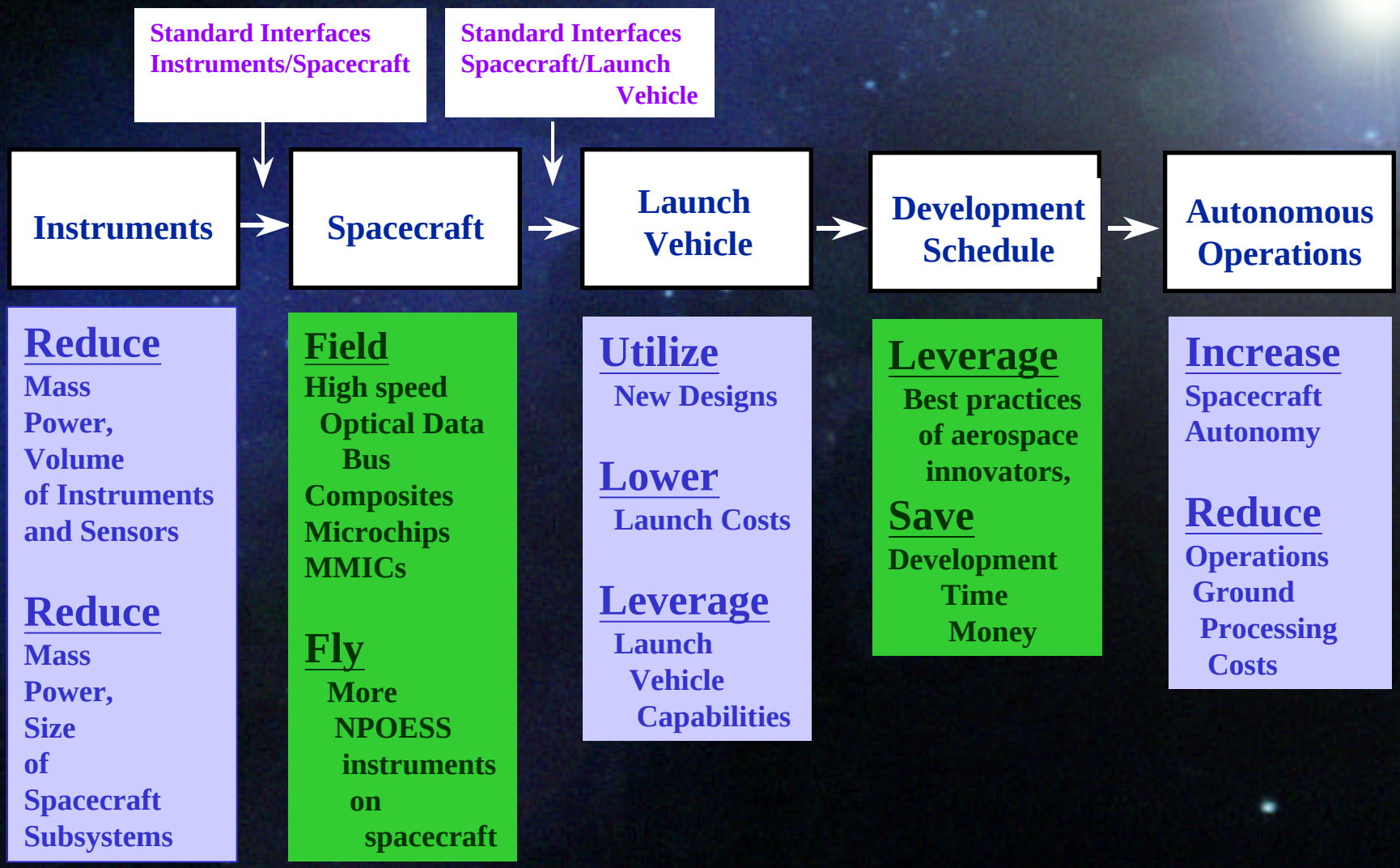
NPOESS Advanced Technology Needs



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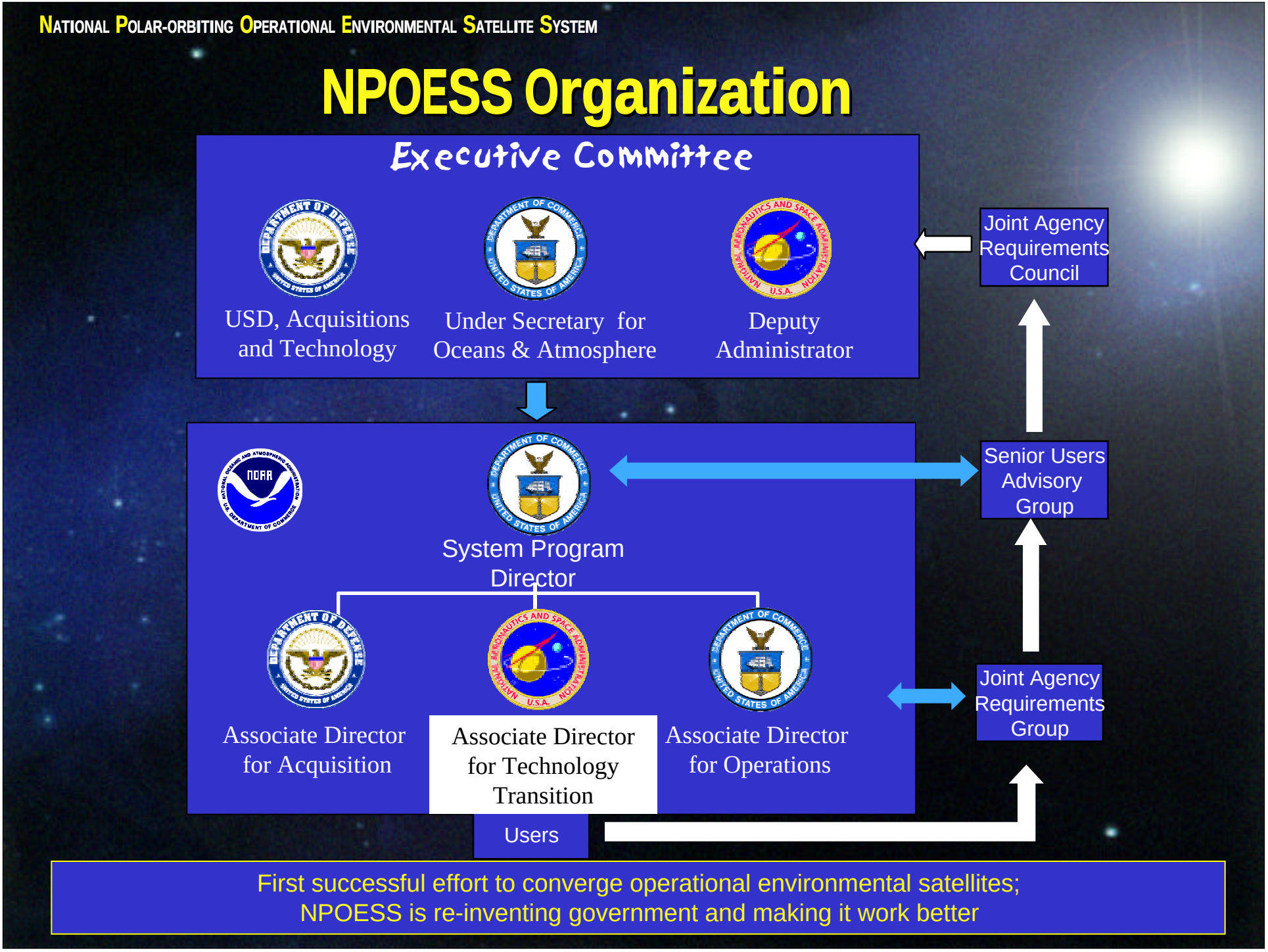
NPOESS Organization



Planning for the Future

Strategic Plan for Technology Transition

National Polar-orbiting Operational Environmental Satellite System (NPOESS)

Integrated Program Office
February 17, 1998

National Pola[illegible] Operational Environmen[illegible]ite System (NPOESS)

Unaccommodated Envir[illegible] Data Records:

Technology Status and Promising Technological Areas

June 20, 1996

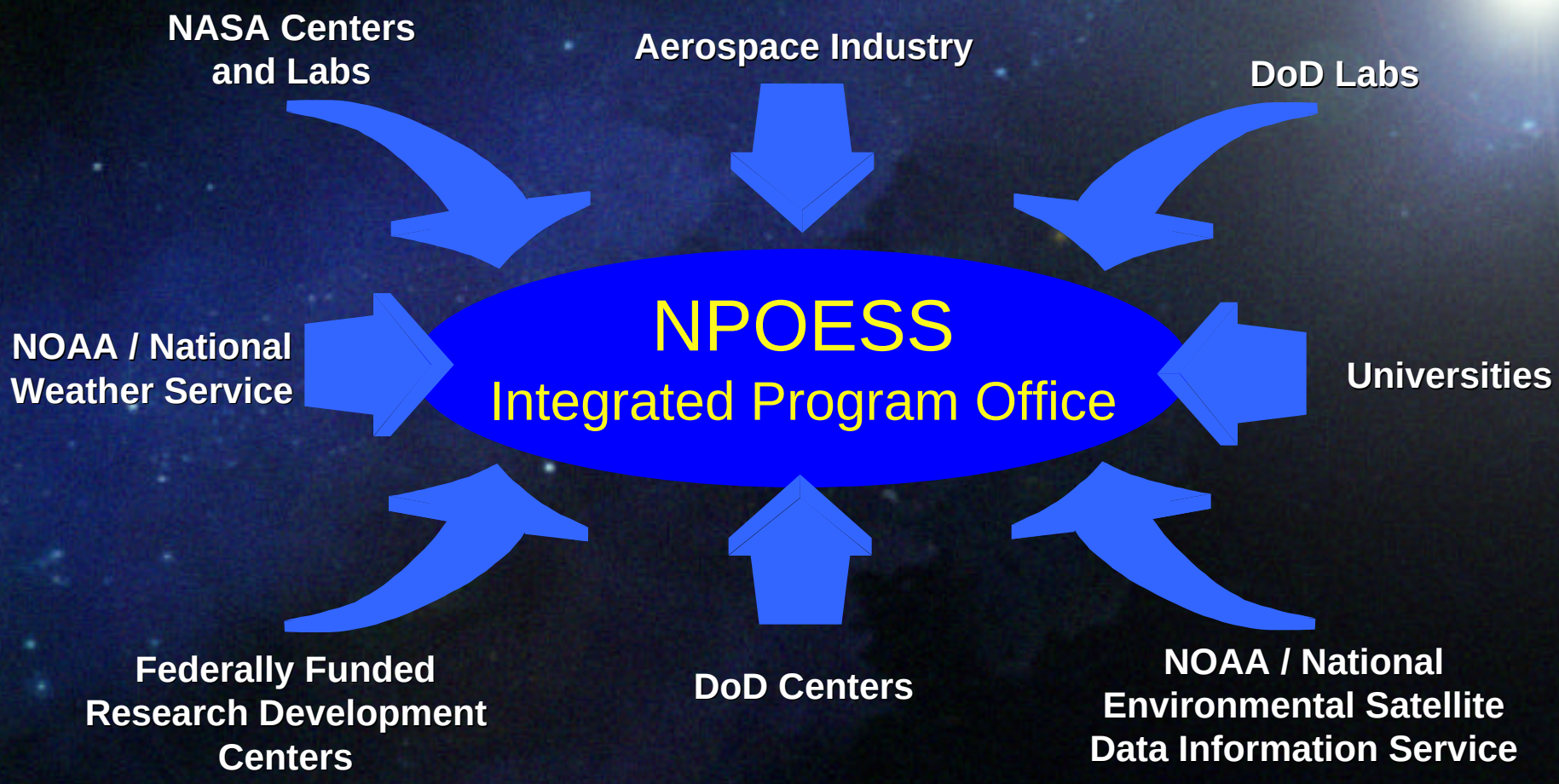
NATIONAL POLAR-ORBITING OPERATIONAL ENVIRONMENTAL SATELLITE SYSTEM

Office of Associate Director for Technology Transition (ADTT)

Prepared to Meet Technology Needs

ON-TARGET SUPPORT TO NPOESS

Contributions from Other Organizations



NPOESS development strategy employs the best talents of the Government, Academia, Industry, and the International space community to meet future space challenges

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Making Things Happen!